## CLAIMS

1. Method for measuring a fill level (7) of a fill substance (1) in a container (3) and for monitoring at least one predetermined fill level ($L_{MIN}$, $L_{MAX}$), using a fill level measuring device (5) working according to a travel-time principle, wherein, in each measuring cycle, transmission signals (S) are sent toward the fill substance (1) and their echo signals (E) are received, the fill level (7) is determined, based on the echo signals (E), in a first evaluation method, and it is determined, based on the echo signals (E), in a second evaluation method independent of the first evaluation method, whether the fill level exceeds or falls beneath the predetermined fill levels ($L_{MIN}$, $L_{MAX}$).

2. Method for measuring a fill level (7) of a fill substance (1) in a container (3) and for monitoring at least one predetermined fill level ($L_{MIN}$, $L_{MAX}$), using a fill level measuring device (5) working according to a travel-time principle, wherein, in a fill level measuring cycle, transmission signals (S) are sent toward the fill substance (1) and their echo signals (E) are received, the fill level (7) is determined, based on the echo signals registered in the fill level measuring cycle, in a first evaluation method, and, in a limit level measuring cycle, transmission signals (S) are sent toward the fill substance (1) and their echo signals (E) are received, and it is determined, based on the echo signals registered in the limit level measuring cycle, in a second evaluation method independent of the first evaluation method, whether the fill level exceeds or falls beneath the predetermined fill levels ($L_{MIN}$, $L_{MAX}$).

3. Method as claimed in claim 1 or 2, wherein the fill level measuring device (5) includes a first signal processing branch (27) in which the echo signals (E) applied for determining the fill level (7) are conditioned.

4. Method as claimed in claim 1 or 2, wherein the fill level measuring device (5) includes a second signal processing branch (31, 35) in which the echo signals (E) applied for detecting the exceeding or falling beneath of the fixedly predetermined fill levels ($L_{MIN}$, $L_{MAX}$) are conditioned.

5. Method as claimed in claim 1 or 2, wherein, for determining the exceeding or falling beneath of the predetermined fill levels ($L_{MIN}$, $L_{MAX}$), an echo function is derived from the echo signals (E) which represents an amplitude of the echo signals (E) as a function of travel-time (t), a measure for area under the echo function in a region (I, II) of particular travel-time ($t_{MIN}$, $t_{MAX}$) to be expected for the predetermined fill level ($L_{MIN}$, $L_{MAX}$) is determined, it is detected that the fill level exceeds the particular predetermined fill level ($L_{MIN}$, $L_{MAX}$) when the measure exceeds a predetermined reference measure and it is detected that the fill level falls beneath the particular predetermined fill level ($L_{MIN}$, $L_{MAX}$) when the measure falls beneath a predetermined reference measure.

6. Method as claimed in claim 5, wherein the measure corresponds to an integral over the echo function in the region (I, II) of the particular travel-time ($t_{MIN}$, $t_{MAX}$) to be expected for the predetermined fill level ($L_{MIN}$, $L_{MAX}$).

7. Method as claimed in claim 5, wherein the measure corresponds to an average value, median or maximum of the amplitudes of the echo function in the region (I, II) of the travel-time ($t_{MIN}$, $t_{MAX}$) to be expected for the predetermined fill level ($L_{MIN}$, $L_{MAX}$).

8. Method as claimed in claim 1 or 2, wherein, for determining the exceeding or falling beneath of the predetermined fill levels ($L_{MIN}$, $L_{MAX}$), an echo function is derived from the echo signals (E), which represents an amplitude of the echo signals (E) as a function of a travel-time (t), a first measure for area under the echo function in the region (I, II) of a particular travel-time ($t_{MIN}$, $t_{MAX}$) to be expected for a particular predetermined fill level ($L_{MIN}$, $L_{MAX}$) is determined, a comparison measure is, in the same way, determined for a predetermined reference region (R) of the echo function, and, based on a comparison of the particular first measure with the comparison measure, it is determined whether the fill level exceeds or falls beneath the particular predetermined fill level ($L_{MIN}$, $L_{MAX}$).

9. Method as claimed in claim 1 or 2, wherein, based on results of the second evaluation method, a plausibility check is carried out for results of the first evaluation method.

10. Method as claimed in claim 1 or 2, wherein the fill level measuring device (5) works with ultrasound and, for determining whether one of the predetermined fill levels ($L_{MIN}$, $L_{MAX}$) has been exceeded or fallen beneath, emits transmission signals of a fixedly predetermined transmission frequency.

11. A fill level measuring device (5) working according to the travel-time principle, comprising:

A sending and receiving element (11) for sending transmission signals (S) and for receiving their echo signals (E); a first evaluation module (23) for executing a first evaluation method for determining fill level (7); and a second evaluation module (25, 41) for executing a second evaluation method for detecting an exceeding or falling beneath of at least one fixedly predetermined fill level ($L_{MIN}$, $L_{MAX}$).

12. A fill level measuring device (5) as claimed in claim 11, comprising: A first signal processing branch (27) for conditioning echo signals (E) applied for determining the fill level (7); and a second signal processing branch (31, 35) for conditioning echo signals (E) applied for detecting the exceeding or falling beneath of the fixedly predetermined fill levels ($L_{MIN}$, $L_{MAX}$).